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Unloading U.S. wheat from a vessel in Israel.

Israel: After 30 Years Of Success, New Hurdles Appear in Agriculture

By Rafael N. Rosenzweig and Roger F. Puterbaugh

This year, Israel celebrated its 30th birthday. Looking back, the first 3 decades were marked by impressive advances in agriculture—large increases in the production of vegetables, wheat, and poultry products as well as citrus and citrus products. Plus development of new crops, such as cotton, avocados, and peanuts. But, looking ahead brings into focus new problems as the country approaches the limits of growth in certain agricultural necessities—water and land. Finding solutions to avoid stagnation is the immediate task. But, then again, problems—and solutions—are not new to Israel.

Israel, 1948-1978. After 30 years of spectacular development and expansion, Israeli agriculture is approaching the limits of certain natural resources—most importantly, water. As a result, Israel is now confronted with new challenges calling for greater intensification of the use of natural resources and higher economic returns in order to overcome tendencies towards stagnation or possible decline in some agricultural sectors.

While the story of agriculture in this ancient land along the eastern rim of the Mediterranean did not begin with Israel's independence on May 15, 1948, results since then have been significant—a tenfold increase in wheat production, seven times more vegetables, and similar advances for eggs, milk, and poultry meat. As well, development of crops (cotton, peanuts, and avocado) not grown in the area prior to 1948 have become mainstays in Israeli farming. All this points to an agricultural success unique in any context.

The impressive comparisons between 1948 and 1978, however, fail to tell the entire story. Israel's agricultural achievement has not been an uninterrupted line of ascent. Besides the ups and downs stemming from the vagaries of climatic conditions, a tendency towards stagnation and possibly even some regression has become evident in recent years.

In some instances, a pause following a period of rapid development may be for the better. But, since Israeli farmers are not going to sum up their balance sheets at the end of 1978 and "get out of the market," the challenges and uncertainties of the future become much more important than the accomplishments of the past.

Today, Israel faces a double dilemma in two basic agricultural inputs—water and fertile land. In both cases, the country has either hit the limit of growth or is precariously close to it. Practically all the country's available water supply already is being used, and all projections point to the necessity of diverting additional water from agricultural uses towards the needs of industry and the ever-growing demand of households.

Closely intertwined with the water problem is the increasing scarcity of fertile land. While urban expansion along the Mediterranean—especially between Ashdod and Nahariya—puts several hundred hectares under asphalt every year, the last reserves of fertile land in marginal areas of the south are being utilized. However, further development of those areas, located in the semiarid zone, requires the very quantities of water that are no longer available.

Inevitably, such a situation points towards higher degrees of intensification or, in economic terms, achievement of greater returns per cubic meter of water and per hectare of land than was the case in Israel's agricultural expansion during the first 30 years.

Good examples of solutions begetting new problems are drip irrigation to utilize water quotas better for increasing yields and the hothouse culture of export crops. While these processes are obviously the only direction that can be taken, the economic limit of expansion can easily be overstepped, resulting in heavy financial losses. Such developments can be observed throughout Israel, but are especially evident in the south.

Certainly, yields of 300 or even 400 metric tons of tomatoes per hothouse hectare are most impressive, but the economics of the operation are far from sound. For investments of around $175,000 per hectare with the inflationary conditions prevailing in Israel, returns of at least 40 percent per year are necessary just for capital service. Under optimal conditions, this equals $175 per ton of tomatoes for this expenditure alone. Adding in all other costs, the return required would be in the neighborhood of $410 per ton—an almost impossible goal.

Another type of problem concerns wheat. Although the achievement in terms of the 30-year period is excellent, during the last few years the trend is towards a decline in production. Large fertile areas—mainly in the northern valleys—were devoted in the

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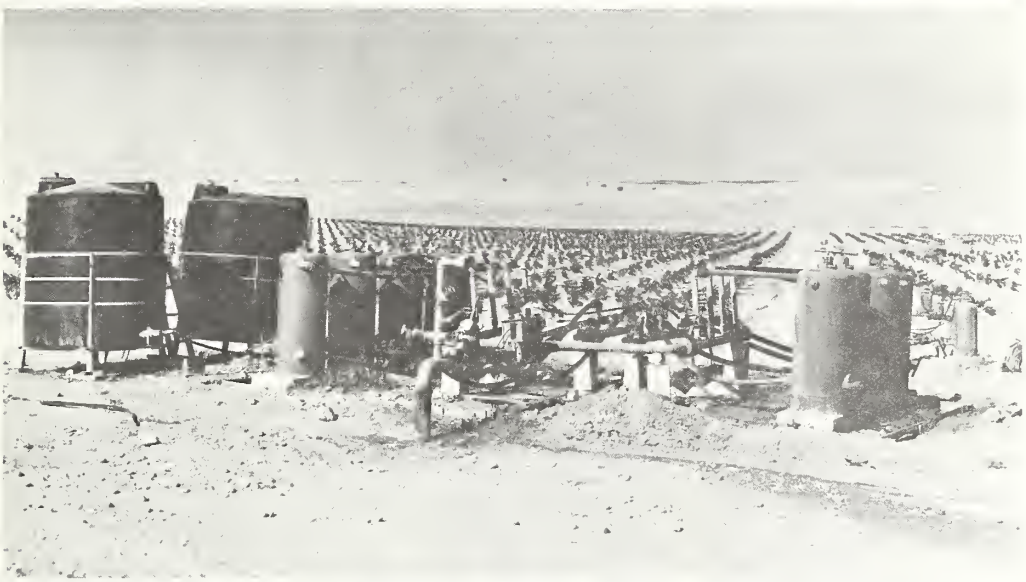


Agricultural scenes in Israel (clockwise from top left): Tomatoes grown under glass—despite high yields per hothouse hectare, large returns are required because of huge investments; inside a poultry house in a sector where production has outstripped demand, causing problems of surplus; a modern milking parlor; drip irrigation to better utilize water quotas; and vegetables produced under plastic for export markets—especially in Western Europe—during the winter months.

past almost exclusively to wheat, but are now planted to cotton. These valleys produced the basic and dependable part of Israel's wheat crop, while the south, with its large areas and erratic rainfall, only harvests about two crops out of seven plantings.

An added dimension to this problem is the sharp increase in the price of water. Previously, water for agricultural uses was heavily subsidized. As this subsidy is gradually removed, water prices are increasing beyond the ability of most field crops to pay for them. Thus, auxiliary irrigation of wheat, an important factor in total wheat production, is declining as well.

The replacement of a crop with another offering better returns is not in itself a negative occurrence. However, in many areas there is no true alternative to wheat.

Problems also appear in the poultry sector. Again, the 30-year production increases are most impressive. Consumption of poultry products in Israel has reached record levels: More than 400 eggs and 41 kilograms of poultry and turkey meat per person per year. Israel's farmers supply all these—and then some. In 1977, egg surpluses were in the range of 200 million, or 15 percent of total production. Most of these eggs, produced from feed made mostly of imported ingredients, were sold at a loss.

Israel's agricultural exports, which 30 years ago consisted entirely of citrus fruits and some of their products, have reached undreamed-of dimensions. During the winter months, Israel has become Europe's truck-garden and its fruits, vegetables, and flowers can be seen anywhere on that Continent. What was once an outlet for surplus produce is now the focus of a minutely planned production and marketing system.

The Government's part in encouraging these developments was—and still is—a considerable one. But in this sector as well, problems are cropping up. When the Israeli pound became almost freely convertible and all export payments above the going exchange rates were abolished, it appeared only a few products could be exported without loss.

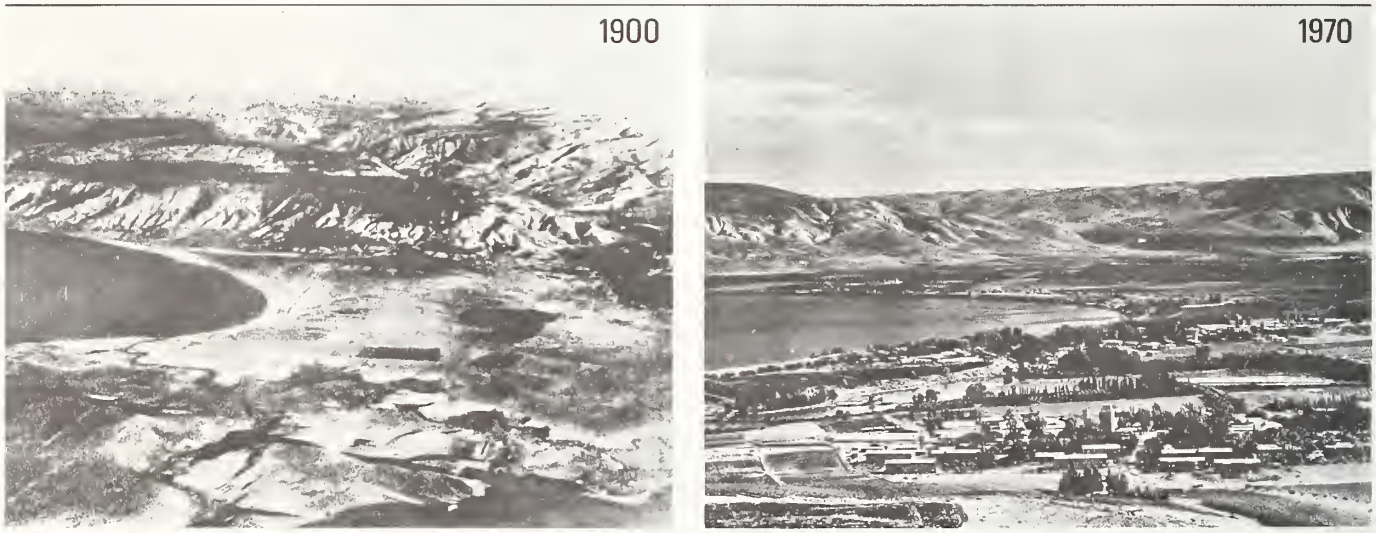
A few months after the New Economic Policy was declared on October 29, 1977, the drop in the value of the Israeli pound and the relative appreciation of several major European currencies created a better-than-anticipated profit situation for many exports. However, the race between rising local production costs and returns from exports continues. A closer look at the relative profitability and marketing chances of many items on Israel's export list may be needed, particularly if the cost/price squeeze continues to intensify.

After 30 years of meeting and measuring up to problems, what are the implications of future changes that will probably occur in Israeli agriculture?

If one makes the following basic assumptions—there will not be a significant breakthrough in field crop yields per unit of water; cost of desalinization of water will not be reduced dramatically; and prices, adjusted for inflation, will follow long-term trends—then, several conclusions can be drawn.

There most likely will be a decline in production of lower-value field crops like wheat and feedgrains. Therefore, Israel should become an expanded market for animal feedstuffs, such as feedgrains and soybeans, and increasing quantities of wheat—commodities that top the list of U.S. farm exports to Israel. U.S. agricultural shipments to Israel totaled $312 million in 1975, dipped to $264 million in 1976, and rebounded to $299 million in 1977. Heading these exports were soybeans and soybean oil, wheat, corn, and sorghum.

On the other hand, Israel probably will increase production and become an even stronger competitor, especially in Europe, in higher value out-of-season produce like fresh fruits and vegetables. In addition, a further expansion of frozen products and, to a lesser degree, of the canning industry most likely will occur. Assuming a continuation of high energy costs,



Then and now, *photos taken 70 years apart show the site of the first kibbutz—Degania Aleph—established along the southern edge of the Sea of Galilee at the turn of the century. Today, there are 226 kibbutzim with a combined population of nearly 100,000 people, accounting for more than one-third of the country's total agricultural production. Israel's population is 3.6 million.*

Israel's comparative advantage in the hothouse industry should continue, especially as solar energy technology becomes more commercialized.

With increasing affluence in Western Europe, demand for out-of-season produce (strawberries, melons, avocados, fresh vegetables, etc.) is far from being satisfied. Buyers in these countries, however, are becoming more sophisticated, demanding higher standards of freshness, quality control, and attractive packaging. Since the home market for these products is quite limited, Israel, as in the past, will continue to gear production and marketing to satisfy foreign requirements.

As an example of future planning, Agrexco, the Israeli marketing organization that handles most non-citrus agricultural produce exports, plans to double exports in the next 5 years —from 185,000 tons this year to 360,000 tons.

In order to handle this quantity, Agrexco expects to increase air capacity to eight or nine jumbo jets, double the capacity of handling facilities at Ben-Gurion Airport, spend $4 million for expanding refrigeration and cold storage capacity at the Port of Ashdod, build another terminal at the Port of Haifa at a cost of $25-$30 million, establish new terminals and branches in Western Europe, link all its overseas branches to a headquarters computer in Tel Aviv to facilitate decision-making, and lease additional fast vessels that will be built especially to transport agricultural produce.

If true peace and full diplomatic relations were achieved in the Middle East, Israeli's trading patterns could change markedly. □

Israeli Agriculture—By the Numbers

agricultural growth Increase in farm output slowed to a preliminary 3.9 percent in calendar 1977 after a jump of 6.2 percent a year earlier. Economic slowdown continues as GNP fell 2.11 percent last year, compared with declines of 1.78 percent in 1976 and 0.83 percent in 1975. Agriculture's share of GNP estimated at 6.2 percent in 1977.

farm production After a healthy advance in 1976, led largely by the livestock sector, rate of increase slipped about one-third last year. Livestock production eased up while citrus output dipped 2.2 percent. Egg production also went down, although surpluses still exist.

major crops Production figures for 1976/77 in metric tons with percentage change from 1973/74 in parentheses: Citrus, 1.5 million (−11); vegetables, 602,500 (+21); cotton, 54,000 (+46); avocados, 23,400 (+56); tomatoes, 230,000 (+10); and melons and pumpkins, 134,900 (+9). Wheat production in calendar 1977 was 230,000 tons, 12 percent above 1976's.

livestock products Production tonnages, liveweight for meats, for 1976/77 with percentage change from 1973/74: Poultry meat, 198,800 (+21); beef, 47,800 (+23); sheep, goats, and other livestock, 21,800 (+8); and table eggs in millions, 1,598 (+19).

leading exports Agricultural exports in calendar 1977 expanded 15 percent to $560 million, compared with a 19.1 percent gain in 1976, when fresh citrus, citrus products, and fruits and vegetables accounted for a little more than 60 percent of export earnings. Topping the list that year, with percentage change from previous year, were: Fresh and dried citrus, $172.4 million (−2); processed citrus, $72.7 million (+21); cotton, $47.6 million (+54); fresh vegetables, $21.8 million (+61), and avocados, $15.4 million (+22). Agriculture's share of total 1977 exports was 19 percent.

top markets United Kingdom, West Germany, and France. Iran, the only large Mideast market open to Israeli trade, emerged in 1976 as an important outlet as farm exports that year more than doubled to $17.2 million—3.5 percent of Israel's agricultural sales.

trade balance Although Israel's farm agricultural exports rose sharply in 1977, farm imports jumped 12 percent to $790 million, leaving a deficit of $230 million. Farm imports from the United States totaled $299 million, compared with $19 million worth imported by the United States, resulting in a favorable U.S. trade balance of $280 million.

government policy The Begin government, which took office in May 1977, is introducing policy changes, many of which affect agriculture. Prominent are the floating of the Israeli pound, elimination of subsidies, gradual cuts in food subsidies, and possibly less intervention in production and marketing.

Sharp Rebound Seen For Australia's Wheat, Barley Following Short Sorghum, Corn Crops

With a sharp increase in planting and favorable growing conditions thus far, Australia's 1978 production of wheat—to be harvested this November—could jump about 50 percent above the reduced 1977 level of an estimated 9.37 million metric tons.

Area planted to barley, also to be harvested in November, rose substantially and a record production is possible.

In other developments among Australian grains, the drought-affected sorghum and corn crops—harvested last March—were down significantly from year-earlier levels.

Heavy widespread rains fell over most of Australia's eastern grain belt during the last week of May, greatly improving prospects for November's outturn. In April, rains had fallen generally throughout the country's grain producing areas. Substantial seedings had already been made and farmers in some areas waited for fields to dry before resuming planting.

In contrast to last season when drought reduced the harvested wheat area, prospects now are good for an increase of nearly 10 percent in the harvested wheat area this season to approximate the record 10.4 million hectares in 1968.

The sole exception to the generally favorable rain pattern occurred in South Australia where only limited rains have been recorded through early June. Assuming average nationwide yields, Australia's wheat production could possibly reach 14-15 million tons, but if dry conditions continue in South Australia and pockets of New South Wales and Western Australia, the crop may not exceed 13 million tons.

Deliveries of last season's wheat to the Australian Wheat Board (AWB) totaled 8.56 million tons, and this, together with the carryover of 2.07 million tons, brought total marketable supplies to 10.63 million tons. On present indications, domestic sales by the AWB will be about 1.8 million tons, leaving 8.8 million tons for export and carryover as of next November 30. Of this, about 200,000 tons of wheat equivalent will be required for export flour, while the minimum working level carryover is about 500,000 tons.

Consequently, the AWB will not have more than 8.1 million tons available for export as wheat. Virtually all of this has been committed in forward sales to the People's Republic of China (PRC), Egypt, the USSR, Iraq, and Indonesia. Most of the remainder has been reserved for Japan, Yemen, and Malaysia. Accordingly, the AWB is unlikely to make additional sales unless for delivery in 1978/79 (December-November). The Board already has sold 449,000 tons for shipment after November 30.

Australia's barley seedings were increased substantially above the drought-reduced level of the previous year. This expanded area could possibly provide a crop in the range of the 3.2 million-ton record in 1975, compared with 2.4 million tons harvested last November.

If the projected crop is realized, barley exports in the 1978/79 (December-November) marketing year could then show a similar increase from the estimated exports of 1.6 million tons in 1977/78.

Regarding the two grain crops—sorghum and corn—harvested in March, Australia's sorghum production is estimated at 560,000 tons, down from the previous season's 932,000 tons.

Sorghum exports in 1977/78 (April-March) are estimated at 490,000 tons, nearly half of the 972,000 shipped in 1976/77. This decline is attributed to a 200,000-ton reduction in the March 1977 harvest and increased demand for sorghum on local markets. Sorghum exports in 1978/79 are projected to fall even further to 200,000 tons (all to Japan), following a still smaller harvest, combined with a continuing domestic demand for sorghum to replace barley and other grains in short supply.

Australian corn production is estimated at 113,000 tons, off from the 145,000-ton harvest a year ago. The crop in New South Wales was affected by flooding in the coastal areas and in northern Queensland, as the "wet season" experienced one of the lowest precipitation levels on record. Corn exports in 1977/78 (April-March) are estimated at 11,000 tons, compared with 34,000 in 1976/77. □

Based on reports from the Office of U.S. Agricultural Attaché, Canberra.

Large Soviet Grain Crop Seems Likely

Prospects for a large 1978 USSR grain crop appear to have improved over the past month, according to USDA's third forecast of the Soviet grain production. Based on information available in early August, the 1978 harvest seems likely to equal the preseason Soviet plan level of 220 million metric tons and, with normal harvesting weather, could surpass the record of almost 224 million tons produced in 1976.

Chances would currently appear to be about two out of three that the final outturn for total grains will fall within a range of 210-230 million tons; corresponding ranges for wheat and coarse grains would be 100-115 million and 95-110 million, respectively. Barring unusual conditions during the remaining weeks of the season, a total harvest of about 220 million tons is now indicated, including about 107 million for wheat, 102 million for coarse grains, and about 11 million for the total of miscellaneous grains, rice, and pulses.

The estimate of the total grain area was reduced slightly to 129.5 million hectares since the July 10 report. Continued cool, wet weather is expected to result in a somewhat greater area of corn for grain being cut for silage than earlier forecast. □

Major U.S. Soybean Competitors: Brazil, Argentina, Paraguay

By Thomas A. Hamby

The outlook for expansion in oilseed production in Brazil, Argentina, and Paraguay continues to be bright. But rapid growth hinges on improving infrastructural problems—transportation, crushing facilities, and seed varieties. For Peru, however, only imports of soybeans and oil can help fill the void caused by the decline in the domestic fishmeal and oil industry.

During the 1950's, soybean production in Brazil, Argentina, and Paraguay was so low that it was hard to imagine that by 1978 these three countries would account for the bulk of U.S. competition in the world soybean meal and oil market. But today, this is a reality and Latin American oilseed output is still expanding steadily.

On the other hand, Peru, once the world's largest producer/exporter of fishmeal and oil, has fallen on hard times and is becoming a major market for U.S. soybean oil, another situation no one could have foreseen even 10 years ago.

The long-range oilseed production potential in Brazil, Argentina, and Paraguay is good, provided various problem can be dealt with or eliminated. Potential for recovery of Peru's fishmeal industry, however, is not very bright, at least in the short term.

Brazil. Because of the severe drought in the southern states of Brazil, this year's soybean output is being reduced to around 9.95 million metric tons—down 18-20 percent from last year's crop.

Soybean production has grown tremendously in Brazil, rising from 152,000 tons in 1959 to 12.2 million tons in 1977. Recently, soybeans and products have challenged coffee for supremacy as the top foreign exchange earner.

Although Brazilian soybean output in 1977 was only one-third that of the United States, Brazil exported almost 5.4 million tons of soybean meal, 1.1 million tons more than the United States. While Brazil has not threatened seriously U.S. dominance of the world soybean market, it has made no secret of its goal to increase soybean production dramatically from current levels. To further this goal, heavy emphasis is being devoted to research into varieties suitable to Brazil's various climate and soil types.

Soybean production in Brazil had its inception in the State of Rio Grande do Sul in the southernmost part of Brazil. It was a natural place to begin because the infrastructure was already in place for wheat, a crop that has been and continues to be plagued by many problems that result in poor yields. By planting soybeans in rotation with wheat, farmers have another cash crop to cushion the effect of possible wheat crop failures.

Area in production grew slowly from 114,000 hectares in 1959 to 1.3 million hectares in 1970. With the explosion in world demand for soybeans and products, Brazilian area in production expanded dramatically—rising from 1.3 million hectares to an estimated 7.5 million in 1977.

One of the most significant aspects of development in the oilseed industry infrastructure in Brazil has been the growth of crushing capacity. Currently estimated at 13–14 million tons, capacity is expected to exceed 15 million tons by 1980.

This capacity far exceeds the availability of supplies for crushing and this year, particularly, some of the smaller, less efficient crushers may be forced out of business owing to high prices caused by the short crop.

This capacity has resulted from easy availability of credit and has been motivated by Brazil's desire to export finished products rather than raw commodities. There is some indication that credit for this type of investment is being restricted, but expansion and modernization of existing plants will continue.

Inland transportation facilities present a problem because of limited availability of large bulk carriers such as trains and barges. In many areas, trucks provide the only means of transportation and must haul long distances to ports or crushing plants.

Much of the road system in Brazil is inadequate to handle the heavy traffic required of it. The inefficient and inadequate transportation infrastructure results in high costs to the producer. Unless rapid improvements are made, inadequate transportation facilities will present an effective barrier to rapid development of Brazil's frontier soybean production areas.

These areas in the States of Mato Grosso and Goias are expected to account for the bulk of Brazil's future soybean expansion. Since these States are much further from the sea than Brazil's current soybean production areas, adequate transportation facilities must be developed if Brazil's soybean industry is to be viable in these areas.

Modernization of handling facilities at the two major soybean export ports of Paranágua and Rio Grande in the States of Paraná and Rio Grande do Sul, respectively, is expected to continue.

In calendar 1977, these two ports handled 44 and 43 percent, respectively, of Brazil's exports of soybeans and products by volume.

The port of Paranágua also handled approximately 73 percent of Paraguay's soybean exports.

Rapid unloading and loading facilities are being improved. In addition, most of the new soybean storage capacity in Brazil is being built at the ports.

Domestic consumption of soybean products—oil and meal—is increasing; oil consumption is rising rapidly, meal consumption some-

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what more slowly. Currently, soybean oil consumption is estimated at 80,000-90,000 tons per month.

In the Brazilian crop year April 1977-March 1978, an estimated 60 percent of total soybean oil production was consumed domestically. Consumption of this oil is expected to continue to increase rapidly since the Government maintains a price ceiling on soybean oil and meal destined for internal consumption that is below the world price.

Soybean meal consumption is much smaller in relation to total production than is soybean oil consumption. In April 1977-March 1978, only about 18 percent of meal production was consumed domestically, compared with around 60 percent of the oil.

"While Brazil has not threatened seriously U.S. dominance of the world soybean market, it has made no secret of its goal to increase dramatically soybean production from current levels."

Most soybean meal consumed internally in Brazil goes to the poultry and swine industries. Brazil hopes to develop its poultry industry to provide a cheap source of protein to the domestic market. It also plans to expand rapidly into the poultry export market. These efforts could raise domestic consumption of soybean meal.

Another plan—to add soybean flour to bread to improve the nutritional value of that product—could also boost soybean meal consumption. However, this program is handicapped by lack of milling capacity to produce soyflour.

The expansion of planted soybean area in Brazil has been accompanied by growth of research into varieties of soybeans that are more suitable to the different soil types and climates in various parts of Brazil.

Prior to 1972/73, all soybean varieties planted in Brazil were of U.S. origin. Since these varieties were developed for U.S. soils and climatic conditions, they could not realize their full potential in Brazil.

For this reason, the Center for National Soybean Research was established. Headquartered in Londrina in the State of Paraná, the Center coordinates the activities of 200 soybean researchers.

They have been developing varieties of soybeans more suitable to Brazilian climatic conditions. These are being introduced to farmers as they are developed. The result is that today only 25-30 percent of soybeans planted in Brazil are U.S. varieties, compared with 100 percent 5 years earlier.

A major problem the Center is working on involves wheat/soybean doublecropping programs. Wheat production is a high-risk venture. Despite relatively high minimum price levels set by the Government to encourage production, the risk of crop failure because of disease and other factors makes it advisable to have an alternative cash crop.

Doublecropping declined in Brazil this year, however, and a further decline is expected in 1979, as much as 30 percent in Rio Grande do Sul. In Rio Grande do Sul, wheat cannot be harvested until November or December. Because of the late wheat harvest, farmers sometimes miss the optimal planting time for soybeans, which occurs between October 15 and November 15.

Researchers estimate that planting soybeans between November 15 and December 15 reduces yields by an estimated 30 percent. This type of situation is encouraging Brazilian farmers to move away from the wheat/soybean rotation program in favor of soybean monoculture.

Since wheat production remains a high-priority goal, research is being concentrated on developing new soybean varieties that can be planted later in the season and still produce good yields.

Another potential problem is the occurrence of insect infestation and disease in soybeans. This has not been a major problem yet, but this year, there were reports of some damage caused by insects.

Brazil's climate is very warm year round relative to major soybean-producing areas in the United States. The lack of freezing weather is conducive to increasing insect populations because temperatures do not drop low enough to kill insect eggs and larvae. The present trend toward a soybean monoculture in Brazil can only increase the risk of insects and plant diseases becoming a major problem in the future.

In addition to developing suitable varieties for the traditional soybean-producing areas, the Center is concentrating on developing varieties for planting in frontier soybean areas in the States of Mato Grosso, Goias, and Minas Gerais.

Being highly acidic and low in organic material, soils in these States are not as fertile as those in traditional soybean-producing states in the south. This does not appear to be an insurmountable problem, however.

The Center is also working on developing soybean varieties suitable to tropical climates and soils. In the near-equatorial State of Maranhão in northeast Brazil, 2,000 hectares of soybeans were planted as a commercial crop in 1978. Although it is too early to assess the future of soybeans in the Amazon Basin,

researchers indicated satisfaction with results to date.

They expressed concern, however, with potential problems that soybean production in the Amazon Basin could cause. One problem is that high heat and humidity provide an environment conducive to plant diseases that could migrate south to other production areas.

Different growing seasons for soybean production in tropical areas and the more temperate south would mean that Brazil would have soybeans in various stages of growth practically the year round. This would provide an environment conducive to developing insect and disease problems.

Whether Brazil realizes its goal depends on many factors including world prices, improvement in infrastructure, demand, cost of inputs, as well as weather, disease, and insect problems.

The 1978 crop encountered serious drought problems resulting in the first drop in production since 1968. Should planted area expand next season at the 7-8 percent rate of previous years and should yields reach the level attained in 1977, Brazilian soybean production should resume its upward climb in 1979.

According to various cooperatives, currently there is no real alternative to soybeans in the State of Rio Grande do Sul. This is not true in the State of Paraná, where—depending on the price—other possibilities include coffee, cottonseed, and perhaps corn. Another crop that could show increased production is peanuts.

Argentina. Unlike Brazil, Argentina does not have unlimited open lands; most of Argentina's extremely fertile land is already in production of some crop, so that any expansion in oilseed area is going to be a tradeoff with other crops.

Oilseed production estimates for Argentina's 1978 crops are: Soybeans, 2.4 million tons; sunflowerseed, 1.6 million tons; flaxseed, 800,000 tons; peanuts (in-shell basis), 375,000 tons; cottonseed, 370,000 tons; tung nuts, (old crop), 60,-000-65,000 tons; and tung nuts (new crop—crushing began in August) 70,000-75,000 tons.

Soybean exports were estimated at 1.5-1.7 million tons, with most of the shipments to move in the May-August 1978 period because of lack of crushing capacity and storage facilities. Since no large-scale increase in either storage facilities or crushing capacity is expected in the near future, it is anticipated that this pattern of exports will be maintained in the future.

Since existing crushing facilities were designed to crush sunflowerseed, flaxseed, peanuts, and cottonseed, these seeds will be crushed first. Soybeans are crushed after supplies of other oilseeds are depleted. Consequently, soybean crushing will not begin on a large scale until September or October.

Since soybeans and products are used as a residual supply in Argentina (i.e., soybean meal and oil make up any difference between availabilities of oils and meals from other oilseeds and total requirements), actual export volumes of soybean meal and oil will depend on availabilities of other oils and meals.

Before 1977, exports of oilseeds from Argentina had been prohibited in favor of products; but during 1977, exports of soybeans as seed were authorized. This year, further liberalization is anticipated with all oilseeds to be available for export in seed form.

An evaluation of long-range oilseed production in Argentina indicated that most likely expansion would occur in sunflowerseed production. Large-scale expansion is not foreseen in area, but rather in yields owing to larger plantings of higher yielding varieties.

It is hoped that by increased plantings of hybrids, national average yields can be boosted from the currently low 720 kilograms per hectare to around 2,000 kilograms per hectare by the early 1980's. Assuming area remains unchanged, production of sunfiowerseed could increase to around 3.5 million tons—or 2.5 times greater than current production.

Soybean production is also expected to rise; however, expansion is limited by available land, since increasing land in soybeans decreases land available for corn—an important crop in Argentina. By 1980, soybean outturn could be in excess of 3.0 million tons.

It should be emphasized that expansion in area to soybeans and sunflowers will depend on the oilseed grain price ratio, since soybeans compete with corn and sunflowers compete with wheat for land in Argentina.

Of particular concern to Argentine sunflower producers is the recent expansion of sunflower area in the United States. The U.S. crop was only 86,000 tons in 1970, but had mushroomed to 1.3 million tons in 1977.

The 1978 sunflowerseed crop is estimated at 1.7 million tons—more than

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"Most of Argentina's extremely fertile land is already in production of some crop, so that any growth in oilseed area is going to be a tradeoff with other crops."

Cotton Prospects Up, India Trims Imports

By Charles M. Clendenen

India is expecting its estimated 1977/78 cotton production of 5.4 million 480-lb bales—10 percent higher than the previous year's outturn—to keep textile mill activity at a satisfactory level without resorting to any significant volume of imported cotton.

Imports of cotton during 1977/78 probably will be confined to arrivals contracted before September 1977. India's leading suppliers of cotton during the 1976/77 year were the United States, Sudan, Tanzania, Afghanistan, Guatemala, Egypt, Turkey, and the USSR.

India has not authorized any cotton purchases during the 1977/78 year, and has prohibited exports of raw cotton during the year. However, a small quantity of short-staple Bengal Deshi, which commands a premium price in Japan, may be exported this year.

The supply of cotton available to Indian mills is supplemented by sizable imports of viscose rayon. There is an official requirement that manmade fibers must comprise 10 percent of the total fiber used by cotton mills.

Total consumption of manmade fibers in 1977 was 333,000 metric tons, of which 141,000 were imported since domestic production was 192,000 tons. Consumption for 1978 is expected to increase.

India's exports of textiles and cloth declined moderately in 1977 because of the demand recession in the international market, quota difficulties with European Community countries, and the Government ban on cotton yarn exports.

India has reduced the subsidies it pays on its exports of cotton garments, and has ended export subsidies on cotton yarn. However, present Government policy strongly favors increased cotton production. The producer support price for a basic variety was boosted this crop year from the equivalent of about 35 cents per pound to 43 cents.

The current 5-year national development plan (1978-1983) includes a program of gradual expansion of cotton production to 7 million 480-lb bales by 1983—to be achieved without any significant increase in area, which is now about 7.3 million hectares and the world's largest.

India's average cotton yield currently is very low—about 150 kilograms per hectare. The Government calculated that raising average yield to 200 kilograms would supply more than enough cotton to meet all domestic demand and leave a substantial quantity for export.

Cotton fabrics are still preferred for clothing by most Indians. To satisfy this substantial demand and to participate in world textile markets, many textile mills have been built.

Although many of these mills are not economically viable, they are kept open and operating by Government subsidies—mainly to provide employment for more than 1 million workers.

Recently, India's textile industry has been the victim of a prolonged recession resulting from slack

The author is U.S. Agricultural Officer in Bombay.

Guatemala's Cardamom Exports Increasing

Cardamom is fast becoming one of Guatemala's major export crops, its value having risen more than tenfold in the past 5 years.

In 1972, cardamom figured tenth in the lineup of Guatemala's major agricultural exports; it now stands fifth. Because it has proven profitable, increasingly larger amounts are being produced yearly for the world spice trade, according to Francis H. Jack III, U.S. Agricultural Attaché, Guatemala City.

In 1972, when the crop began to gain favor, 26,000 quintals (1 quintal = 46 kilograms) were exported, amounting to $2,258,000. In 1976, the amount exported rose to 42,000 quintals, bringing in a total of $15,313,000. The area under cultivation in 1976 was 22,000 manzanas (1 manzana = 10.7 hectares). In 1977, the value of cardamom exports increased to $22,642,000.

The principal importers of Guatemalan cardamom are Kuwait—which takes 30 percent of Guatemala's cardamom exports—and Jordan. The United States takes less than 10 percent.

The United States, the world's largest importer of spices, took 65,300 tons of Guatemala's cardamom exports in 1977, valued at $870,000. This was slightly less than the previous year's 65,800 tons, worth $508,300.

Guatemala shared the U.S. market with other major suppliers in Africa, Latin America, and the Far East.

At present, Guatemala shares 20 percent of the world cardamon market with Thailand, Nepal, Tanzania, Sri Lanka, and others. Although Guatemala is the second largest cardamon exporter, India is by far the most important source of supply, producing 80 percent of the world's cardamom.

Cardamom is marketed in the form of dried fruits, seeds, or as an aromatic oil (which is extracted from the seed). Its uses are many and varied. It is used as a spice for baking, in beverages, in liquors (espe-

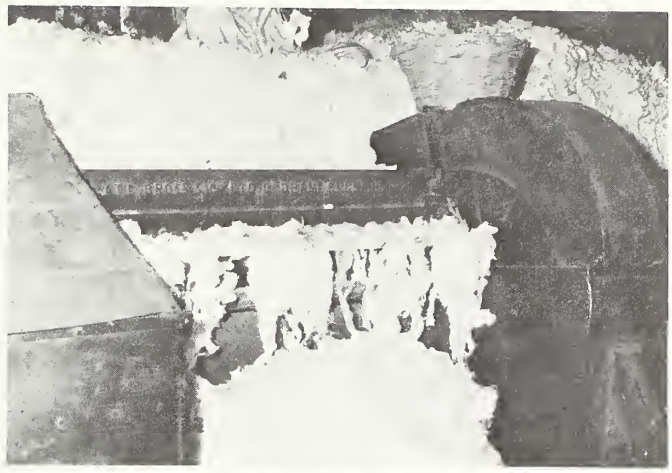
demand and significant increases in costs. At the same time, productivity has declined because of lack of plant modernization.

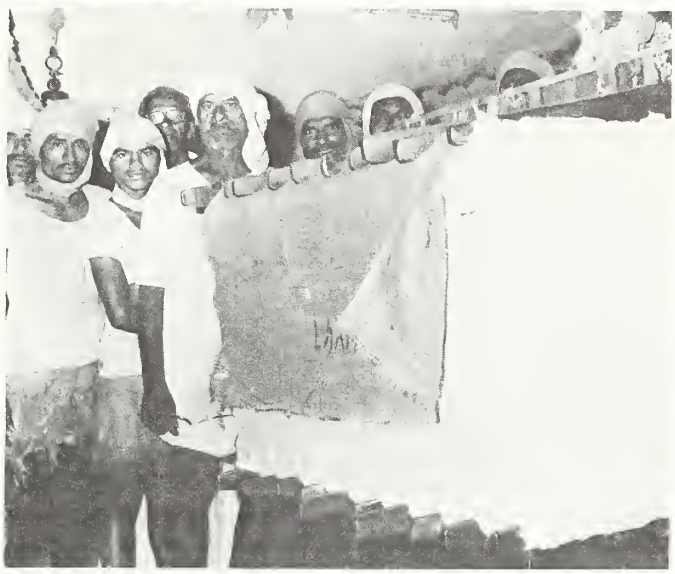
When it became evident that many of the country's textile mills were having serious difficulties, the Government established a National Textile Corporation (NTC) to take over and operate some mills.

NTC thus far has nationalized 105 mills to prevent their closing, and State governments have taken over 11 more.

However, both NTC and the States—temporarily, at least—have exhausted their assistance funds, and another 35 mills remain closed.

Thus far, 151 mills, or about 20 percent of the country's total 704 spinning and composite mills have been nationalized or have shut down. Another 143 mills—mostly marginal operations—qualify for soft loans from India's Industrial Development Bank. □





Above: Indian cotton grown in the 1977/78 season being ginned at Amravati, Maharashtra. Left: Amravati workers baling cotton. The Government hopes to expand production from 1977/78's 5.4 million bales to 7 million bales by 1983 without significant area expansion.

cially in aquavit, a liquor made in Sweden). It is also used by the pharmaceutical, tobacco, and perfume industries. In the Middle East it is common practice to drink coffee with cardamom seeds.

Guatemala's cardamom production got its start approximately 15 years ago, when there was a world coffee surplus and Guatemalan coffee growers' income tumbled because of the rapid drop in prices. In an attempt to increase their income, Guatemalan coffee growers turned to planting cardamom as an alternative or supplemental crop.

Last year, the Government saw in Guatemala's cardamom exports a new source of revenue. Plans were drawn to place a 12-15 percent tax on cardamom exports. The program was dropped before it was put into effect because it became obvious that such a tax would prove counterproductive.

Instead of stimulating the incipient cardamom industry, the tax would have discouraged production because—although the tax was intended to fall on intermediaries and exporters—in reality it would have fallen on producers in the form of lower prices.

Because a great percentage of the work is done by hand, the proposed tax would have affected approximately 100,000 low-income families who depend on this crop for their total income.

Cardamom is produced on small tracts by Indian farmers concentrated in the humid, subtropical slopes of the Alta Verapaz region on the Mexican border.

On the Pacific side there are 150 producers, while on the Atlantic there are 58,004. This figure is broken down as follows: 56,000 small growers (representing 96 percent of the growers in the region) who produce between 0.25-5.0 quintals a year; 2,000 medium-sized growers (3 percent of the total number of producers), who grow between 20 and 200 quintals; the remaining 1 percent is composed of four large growers, who produce over 400 quintals.

In a country where agricultural diversification is an ever-present national goal, and hand labor is not only cheap but abundant, cardamom seems to provide an ideal if partial answer to both problems in view of the marketing potential already demonstrated. In fact, there has even been talk of establishing a Community of cardamom-producing countries with the purpose of obtaining price stability, setting up programs to increase consumption, researching methods for increasing production, and improving marketing methods. □

Cooperator Baker Training Programs Good Tool To Spur Wheat Use

Foreign Agricultural Service wheat cooperator programs have been around for a long time—all with the same purpose—to boost exports of U.S. wheat and flour. The forms taken by these programs are myriad, but among the most striking are those aimed at training new bakers or improving the techniques of bakers already in the trade.

Over the years, Western Wheat Associates (WWA) and Great Plains Wheat, Inc. (GPW), the two USDA cooperators serving overseas as market development arms for U.S. wheat producers, have designed programs to boost sales of U.S. wheat and flour by aiding present and potential buyers to better understand the uses to which high-quality U.S. wheat can be put. This is the underlying purpose of the bakers' training programs.

These programs, perhaps having the most direct impact on the use of U.S. wheat and flour of any cooperator programs, are geared to meet baking industry needs for trained bakers in a large number of wheat-importing countries.

To meet these demands, the two wheat cooperators —with the aid of third-party cooperators such as milling firms and associations, large bakeries, or schools —have established full-fledged bakery schools in several Latin American and Far Eastern countries, while at the same time making available other miscellaneous training courses and technical sessions, as required.

- In some instances, bakers may spend several months or longer at a GPW- or WWA-sponsored baker's school affiliated with existing institutions of learning or with successful, modern commercial bakeries. Or the student may attend a school set up only to teach basic baking methods.
- Or, if the student is in need of training of a more technical nature than can be obtained locally, he might be sent to an out-of-country school, perhaps affiliated with a university or bakery. Or he may come to the United States for training at an American baking school.
- If his requirements are limited in scope, he may just travel to a nearby town to join other bakers from the region to fully explore the manufacture of a single product—say, tea biscuits —in a seminar lasting several hours. Or he may take a weeklong refresher course to hone skills he already has.

GPW, whose efforts are largely centered in Europe, the Caribbean, Latin America, the Middle East, and Africa, and WWA, operating in Asia, have participated in the training of thousands of bakers at all levels of competency, although the total figure is difficult to ascertain. But in any event, whether the student was an apprentice, a journeyman baker, or a baker/administrator, he could be certain he was learning the latest baking methods and receiving technical advice not readily available elsewhere.

In Latin America, GPW has been providing technical and other assistance to baking schools in several countries. The Venezuelan Vocational School (INCE)—a system of five individual schools—has benefited from GPW help since 1967. Turning out more than 50 skilled bakery workers per school year, INCE's courses of training are geared to the needs of practicing bakers and to those with minimal training. The other phase is to train apprentices.

In El Salvador, the baking school—founded in 1969—is jointly supported by GPW and the MOLSA milling Company. GPW normally holds regularly scheduled seminars, in addition to the baking and pastry courses given by MOLSA.

The SENA Baking School in Bogota, Colombia, offers a curriculum for apprentices—developed by Great Plains Wheat—requiring 2 years of academic training and 1 year of practical experience. It also offers a complementation course of 1 year for bakers seeking to improve the techniques they already possess.

A Guatemalan Baking School has been in operation for several years and another is expected to be opened in Trinidad.

In addition to the support given to baking schools, GPW sponsors various types of seminars overseas. While Europe generally has a long baking tradition and has little need for technical advice on baking techniques, GPW plans to hold seminars in Poland, where the Government is encouraging the establishment of family bakeries, and in Portugal. Other GPW seminars are scheduled for Africa and the Middle East to meet the needs of bakers in those regions.

WWA holds courses, sponsors baking schools, and works in cooperation with existing schools in Japan, Korea, Taiwan, the Philippines, Indonesia, and India. In addition, there is a regular flow of students from neighboring countries to these schools and to the United States.

WWA also sponsors seminars throughout the Far East on such subjects as basic methods; cake, pastry, and cracker-baking techniques; and proper wheat usage.

WWA baking schools develop skilled bakers with machine-like regularity. In Tokyo, in fiscal 1977, WWA trained 264 bakers and allied industries employees in three basic bakery classes. Forty-eight other students completed two short baking courses and 260 attended basic seminars .

In addition, 725 bakers attended WWA cake and pastry school classes and technical assistance was provided on cake and pastry methods to more than 1,000 other bakers.

Also during fiscal 1977, 26 Korean students completed 1-year vocational courses in Seoul; 84 others completed a 6-week-long bakers' course; and 250 operators of so-called window bakeries attended seminars.

By Marcellus P. Murphy, staff writer, *Foreign Agriculture.*

Clockwise (from top far left): William Sultan, Western Wheat Associates, USA, demonstrates pizza making to Indian bakers; cake-making session in Japan; show of hands at China Baking School (Taipei) indicates non-Chinese students attending session; bakers' training session in Indonesia.

In the Philippines, the story was much the same. There, WWA cooperates with the Philippines College of Arts and Trades (PCAT) in the operation of a bakers' school. In fiscal 1977, 154 bakers graduated from 12 PCAT courses.

In India, WWA sponsored courses in Bombay from which 120 students received training in 10 short bakery courses, and 259 other student bakers received instructions in 17 short courses held on the campus of the University of Agricultural Sciences in Dharwar.

In Indonesia, the WWA baking school, connected with Jakarta's Triskati University, graduated its first class in September 1977. Expected to train 150 bakers yearly in basic baking technology, the school will help alleviate the country's shortage of bakers.

Plans are being developed to establish a baking school in Pakistan in cooperation with the Roti Corporation. The school should be in operation in 1979.

U.S. wheat exports to the countries in which WWA and GPW have participated in baking school activities have generally increased, although it is impossible to attach credit for the rises to any one or any series of promotional activities. But merely as examples, the following U.S. export figures are cited in thousands of metric tons for the 1967-77 decade:

	1967	*1977*
Colombia .	149.7	317.1
El Salvador	51.7	99.7
Guatemala	69.9	104.1
India	5,627.8	576.1
Indonesia .	2.4	423.0
Japan	2,225.2	3,364.9
Korea	954.3	1,970.5
Philippines	612.1	414.1
Taiwan ...	527.7	458.0
Venezuela	596.4	647.0

In addition to the bakers' programs, there are a number of others geared to the needs of consumers located in many lands, in varying economic, social, and professional strata. These include the Japanese housewife whose interest in U.S. wheat flour is centered in the fact it makes into superb noodles, and the Indian restaurateur who now can offer his patrons a wider variety of U.S.-type breads because of cooperator programs.

And, too, there is the Central American flour miller who can provide technical assistance to his baker customers, using information he acquired in cooperator seminars or training classes.

And long-range cooperator plans call for the repeat or enlargement of such programs to meet existing needs, and the creation of new ones to meet new demands. □

Castorbean Output In Brazil on Upswing, But Stocks Still Low

By Edmond Missiaen

Brazil's castorbean production fell to a low of only 170,000 tons in 1976, but output is now on the upswing again as a result of stimulating prices and the drawdown of castor oil stocks during the past 2 years.

The world's largest producer of castorbeans and the largest exporter of castor oil, Brazil has seen its output fluctuate during the past 5 or 6 years as producers reacted to the ups and downs of the world market and various climatic problems.

Under the stimulus of higher prices, output jumped from 265,000 metric tons in 1972 to 420,000 and 573,000 tons in 1973 and 1974, respectively. But production dropped sharply during the following 2 years, owing to lower prices, huge castor oil stocks in Brazil, frost in southern Brazil in 1975, and a severe drought in Bahia and the rest of Brazil's northeast in 1976.

Production in 1977 was estimated at 230,000 tons, an increase of 35 percent over 1976 levels. Dry weather in the States of São Paulo and Paraná was the principal cause of the lower-than-anticipated production in 1977. Total planted area was estimated at 252,000 hectares.

Castorbean production in 1978 is expected to be 360,000 tons, up 57 percent from 1977's short crop. Increased producer interest in castorbeans is attributed mostly to the current high levels of prices.

Regional production for 1978 is estimated at: Center south 150,000 tons; Bahia 150,000 tons; and other northeast areas 60,000 tons.

Total planted area for the 1978 crop is estimated at 311,000 hectares. The January-May drought, which caused much damage to southern Brazil's crops, apparently had little effect on castorbeans. The outturn for Bahia was reduced slightly because of heavy rains in that area.

Castorbeans are grown in three separate regions of Brazil—the center south (where production is concentrated in the States of São Paulo and Paraná), the State of Bahia, and the other northeastern states.

In the center south and Bahian areas, there are two crops a year, so the total harvest season extends from February or March until October or November. In the other northeastern states, there is only one crop per year, harvested August-November.

Except for 10 or 15 percent of the crop, which is collected from plants along roadsides, castorbeans are grown on small farms. It is a valued crop on many of these farms because the extended length of the harvest season provides employment for family labor and a source of income over a long period of time. In Bahia and elsewhere in the northeast, the plants are perennial, but in the center south, they are replanted annually. Little or no mechanization is used in castorbean production.

Exports of unprocessed castorbeans have not been permitted since 1959, and, as a result, except for a seed reserve, all of Brazil's castorbeans are crushed domestically. In addition, castorbeans are often imported from Paraguay for crushing and reexport for oil. In 1977, some 12,454 tons of castorbeans were imported from Paraguay.

The extraction rate for castor oil is about 43 percent. Thus, castorbean output of 230,000 tons in 1977 plus imports less seed reserves and losses of roughly 5,000 tons was sufficient to produce 121,000 tons of castor oil. Actual supplies of oil were somewhat higher because of the carryover of castorbeans and castor oil from 1976. Production of castor oil in 1978 is forecast at 156,000 tons.

The bulk of Brazil's castor oil output is exported, but in recent years the domestic market has been growing rapidly and now accounts for 30,000-40,000 tons per year—about one-fourth of total output.

Brazil's stock of castorbeans and oil grew to unusually high levels during 1974 and 1975. By December 31, 1975, the carryover reached its peak level of 170,000 tons (beans plus oil—oil equivalent). Castorbean production in both 1976 and 1977, however, was less than combined export and domestic demand, thus drawing down the heavy stocks.

By the end of 1977, total stocks—in oil equivalent—were less than 33,000 tons, foreshadowing a very tight supply situation for the first few months of 1978 before the new crop could be crushed. A big production jump is forecast for 1978, but even so, export availabilities may be no more than in 1977.

Export availabilities in 1978 (including oil crushed from imported Paraguayan castorbeans) are likely to be around 120,000 tons. Brazil also exports between 500 and 1,000 tons of hydrogenized oil per year.

All exports are funneled through a Government-sponsored castor oil export pool (Coordinating Commission for the Export of Castor Oil). The pool was formed in May 1974 when world markets became depressed. Its purpose was to avoid the ruinous price competition among the various exporters of Brazilian castor oil and to regulate the distribution of Government-owned stocks among the exporters. The Government acquired these stocks beginning in May 1974 through its price-support programs. The marketing crisis for which the pool was formed has passed, but there have been no moves to disband it.

Export sales of castor oil—crude or hydrogenized—are eligible for a tax credit that was reduced from 10 percent to 4 percent of the f.o.b. value in August 1977. In addition, castor oil exports are exempt from the 4-percent industrialized products tax, and profits from these exports are not subject to income tax. □

The author is U.S. Agricultural Officer, São Paulo.

Continued from page 9

South American Oilseeds

Argentina's expected outturn for this year—making the United States the world's second largest producer of sunflowerseed after the Soviet Union. Fears have been expressed that U.S. exports might diminish Argentina's market share in the valuable West German sunflowerseed market.

Paraguay. Regarding oilseed production, Paraguay has a great deal of potential but also many problems. Following the United States, Brazil, and Argentina, it is the world's fourth largest producer/exporter of soybeans. For 1978, production is estimated at around 275,000 tons, compared with an estimated 375,000 tons in 1977.

Exports of beans reached an estimated 260,000 tons in 1977. Nearly 200,000 tons of this amount were transported overland through the Brazilian State of Paraná and exported through the port of Paranágua. Some soybeans are crushed in Paraguay, but the oil and meal are primarily for domestic consumption. Only insignificant amounts of meal are exported, mainly to Chile and Europe.

Soybean production in Paraguay is confined primarily to an area east of the Paraguay River; about 70 percent of the country's soybeans are grown in Itapua and Alto Paraná Departments. The country is getting some investment in soybean production from Brazil.

Soybean production has been expanding rapidly in the past few years, but severe limitations exist, such as inadequate transportation facilities, poor farming techniques, and lack of credit.

According to one source, if these limitations could be surmounted, there is sufficient land available to produce 5-10 million tons of soybeans; however, much of this land has not been cleared. In some areas of Paraguay, yields are equal to those of Paraná, but this is not the case everywhere. Yields on land currently in production are estimated at around 1,600 kilograms per hectare. At present, Brazilian varieties of soybeans are being planted.

One infrastructural problem is crushing mills—most of them are old, in poor shape, and designed for cottonseed.

Peru. Until surpassed by Norway in 1977, Peru was the world's largest producer/exporter of fishmeal and oil. In the early 1970's, Peru's catch was in excess of 10 million tons of anchovies (the equivalent of 2.2 million tons of fishmeal and 301,000 tons of fish oil) for processing into fishmeal and oil.

In 1973, however, the anchovies disappeared from what had been one of the richest fishing areas in the world. Several theories have been advanced as to why this occurred. The most prominent of these theories cite either a change in the Humboldt sea current—depriving the fish of necessary nutrients—and/or heavy overfishing in the late 1960's and early 1970's. Whatever the reason, Peruvian production of fishmeal and oil had suffered.

Although recovered somewhat from the low 1973 volume of 423,000 tons of meal and 40,000 tons of oil, production has not approached the pre-1972 volume. In 1977, production of fishmeal and oil reached only 493,000 and 101,000 tons, respectively; the meal level was near to the 1973 output.

The relatively higher oil output, compared with that of 1973, is the result of the increased catch of sardines and mackerel—species that contain more oil than the smaller anchovies. However, availability of these species is limited. For 1978, there is little prospect of recovery. Currently, total catch estimates for fishmeal and oil production approximate last year's 2.2 million tons.

The disappearance of the anchovies has had a devastating effect on the shaky Peruvian economy; the fishmeal and oil industry had been a major source of revenue, accounting for a large share of Peru's export earnings. In 1970, Peru's exports of fishmeal and oil brought in $331 million, or 31 percent of total export earnings. In 1977, fishmeal exports accounted for $184 million, or 11 percent of total export earnings. No fish oil was exported in 1977. In real terms, the decline in earnings has been even greater because of inflation.

In addition to aggravating balance-of-trade problems, the decline in anchovy catch is causing a shortage of edible oils for Peru's rapidly growing population. Fish oil is the largest component of domestic edible oil production, accounting for 74 percent of total production of 135,000 tons in 1977. Total domestic consumption of all fats and oils in 1977 has been estimated at 203,000 tons.

If fish oil production continues to decline, this demand will have to be met with greater imports, primarily of soybeans for crushing and soybean oil from the United States. During October 1977-September 1978, U.S. soybean oil exports to Peru under commercial and Public Law 480 programs may total over 90,000 tons, compared with 57,326 tons during the previous year. Domestic production of soybean oil and cottonseed oil is small. □

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IFC Invests $23 Million In Egyptian Sugar Project

The International Finance Corporation (IFC), an affiliate of the World Bank, is investing $23 million in a $125.9-million sugar-oriented agribusiness venture in Egypt sponsored by Egypt's only sugar producer, the Societe des Sucreries et de Distillerie d'Egypte.

The project will rehabilitate and develop approximately 20,000 hectares of nonarable land. This supports the Government's efforts to bring under cultivation about 117,000 hectares and initiate a reclamation program for another 117,000 hectares during the Five-Year Plan to help meet the expanding food requirements of Egypt's population.

The venture will benefit an estimated 100,000 individuals by increasing the productivity and earnings of some 20,000 outgrowers families, provide direct employment for 3,000 staff and workers, and improve domestic food supplies with the production of grains now being imported.

The IFC investment is being made in Delta Sugar Company, a new enterprise that will introduce sugarbeet in Egypt. Societe des Sucreries et de Distillerie d'Egypte, an experienced sugar grower and refining organization and six other Egyptian companies and institutions are investing $34.2 million in equity, the Islamic Development Bank $6.2 million, Fives-Cail-Babcock (a French sugar-mill equipment manufacturer) $4.7 million, and IFC $2 million.

Arab African International Bank (Cairo), Arab Bank Limited (Cairo), Citibank, N.A. (Cairo Branch), Societe Arabe Internationale de Banque, and Union de Banques Arabes et Francaises-UBAF are joining the financing as participants in IFC's loan. Other loan financing will be provided by Egyptian banks, $32.9 million; the French Government, $6 million; and suppliers' credits, $18 million. Cash generation will meet the remaining project costs. IFC is also making a $1-million contingent commitment in case of overrun.

Delta Sugar will establish a 250-metric-tons-per-hour sugarbeet mill, which at full production will produce annually 100,000 tons of refined sugar, 32,000 tons of molasses, and 35,800 tons of beet pulp. The mill is to be built in Hamoul, a previously uninhabited area of the country in the northern part of the Nile Delta. Project financing also covers the cost of support facilities for staff, farm workers and their families including housing, schools, and medical facilities.

In addition to its own beet production, Delta Sugar will rely on outgrowers farming approximately 39,000 hectares to supply about two-thirds of the mill's beet requirements. A company extension program will assist in outgrower land preparation, seed supply, pest controls, and guidance in agricultural practices.

The venture will not only improve sugar production in Egypt but also the availability of a variety of grains and Egyptian clover, which will be grown to ensure adequate crop rotation. The project is expected to diminish Egypt's reliance on imports, particularly of sugar, which are now averaging 200,000 tons annually, and result in estimated foreign exchange benefits at $35 to $45 million a year. □

Japan Lifts Controls on Minor Items

In line with this year's U.S.-Japan trade agreement, Japan has removed quota controls on 12 products, including nine agricultural items of minor significance.

Of the products affected by the action, Japan imported only about $12 million worth in 1977 and 1976, with just a small part of these imports coming from the United States.

Among the agricultural items covered by the quota removals, effective April 1, were shelf-stable pork products, which were removed from the quota for canned pork.

Several sugar products, including malt sugar; rock, cube, and loaf sugar; sorbose and maple syrup also were affected by the measure as were nuts in pulp form, apricots in pulp form, and lime juice.

Products remaining under quotas include canned pork (other than the shelf stable), beef, fresh oranges, canned pineapple, certain fruit juices, tomato juice, tomato ketchup and tomato sauce, flour, dried peas and beans, and peanuts.

In calendar 1977, Japan imports of U.S. farm goods reached around $3.8 billion—the largest single-country market for U.S. farm products. □